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(54) DECANTER CENTRIFUGE.

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(56) References cited:
EP-A- 0 177 838
FR-A- 2 057 600
US-A- 3 143 504
DE-B- 1 119 173
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US-A- 3 428 246

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Description

The invention relates a decanter centrifuge comprising a rotatably journalled drum having at one end outlet openings for the separated liquid phase, and a conveyor rotatably journalled in the drum with a conveyor body containing an inlet in the form of a cavity for the feed to be separated, said inlet being radially defined by a wall coaxial with the conveyor body and provided with inlet apertures located between two adjacent flights of the conveyor and connecting the inlet with the space between the conveyor body and the internal side of the drum, the inlet being axially defined by a rotationally symmetrical first end wall and a second end wall located opposide the first end wall, said second end wall having a central projection extending towards the first end wall and containing an axial bore for an inlet pipe for the feed, said inlet pipe being coaxial with the drum, and having a mouth facing the inlet and being located in the plane perpendicular to the axis of the drum.

In decanter centrifuges of this type, it is a problem that the feed during acceleration to the angular velocity of the conveyor body receives twice as much energy as necessary for the liquid to form a liquid layer along the internal side of the inlet. The excess energy settles in the liquid in the centrifuge as undesired turbulent flows extending from the inlet into the space between the conveyor body and the internal side of the drum where the energy is finally converted to heat.

The circumstance that excess energy is supplied to the liquid will be recognized by studying a unit cube of liquid present at the internal liquid surface of the inlet. This cube will have a kinetic energy given by

$$\tfrac{1}{2}\rho\omega^2 r^2,$$

wherein ω is the angular velocity of the conveyor body, and r is radius to the overflow edge. The angular momentum L of the liquid cube about the axis of rotation is

$$\rho\omega r^2.$$

This angular momentum results from the influence of the inlet which rotates with the angular velocity ω. The energy supplied from the motor propelling the decanter centrifuge is thus

$$L\omega = \rho\omega^2 r^2.$$

It will be seen that this energy is twice as large as the above stated energy that was necessary to keep the liquid cube in the free surface.

This excess energy cannot be deposited in the liquid or dissipated without giving rise to interfering liquid flows in the comparatively thin liquid layer on the internal side of the inlet, thereby decreasing the efficiency of the separation.

US patent No. 3.428.246 describes a decanter centrifuge of the above type where accumulation of solids in the inlet and resulting erosion of the inlet pipe is avoided by means of radial ribs on the first end wall in the peripheral area at the inlet openings, a second end wall shaped as an inclined baffleplate, a deflecter assembly on the inlet pipe and the projection on the second end wall, and outlet openings for the separated liquid located at a radius which is greater than the radius to the inlet openings.

EP patent application No. 0.177.838 describes a decanter centrifuge in which a flocculant is added to the feed in the area between the first end wall and the outlet openings. The flocculant is supplied under pressure through a nozzle and the feed flow is partly penetrated by the flocculant. The feed flow shown in the drawing, indicates that the outlet openings for the separated liquid is located radially further out than the inlet openings in the inlet.

In a centrifuge described in FR patent No. 2.057.600 the outlet openings for the liquid phase are located radially inwards of the inlet openings, such that the liquid phase partly fills the inlet. The purpose is to effect separation of the solids within the inlet. In this centrifuge the second end wall is reduced to a set of spokes carrying one end of the tubular conveyor body, in order to permit the liquid phase to escape from the inlet directly to the outlet openings.

It is a main object of the invention to provide a decanter centrifuge having an inlet in which said excess energy may be dissipated before the feed flows through the inlet apertures and discharges into the space between the conveyor body and the internal side of the drum where the separation of the solid constituents is effected.

It is a further aim of the invention to demonstrate how the inlet of the decanter centrifuge may be shaped in order to regulate the flow therein to various rates of flow or different types of feed.

The decanter centrifuge according to the invention differs from the prior art in that the mouths of the inlet apertures in the inlet are located on a radius greater than the radius to the outlet openings, that a peripheral area of the inlet outwardly defined by the radius to the inlet apertures is free of carriers, inwards extending projections or the like, that the second end wall is rotationally symmetrical and that the projection of the second end wall has the shape of a truncated cone whose pointed end faces the first end wall.

The feed flowing through the inlet pipe is led as a jet directly towards the first end wall where it divides and flows towards the radially confining wall of the inlet. As the wall includes no members contributing to rotating the feed, merely a torque is transferred to the feed determined by the friction between the feed and the internal side of the end wall. The angular velocity of the feed in the inlet may therefore be kept substantially lower than the angular velocity of the conveyor body. The free liquid surface in the inlet will therefore be positioned on a considerably smaller radius than the radius to the outlet openings.

It is then obtained that the flow in the inlet, when the decanter centrifuge has attained its normal operating condition, mainly passes in the direction from the first end wall and parallel to the free surface in the inlet towards the second end wall and a uniform outflow is concurrently effected through the inlet apertures. When the feed approaches the inlet apertures it has by and large attained the same angular velocity as the conveyor body, but due to the comparatively long path of flow in the thick liquid layer in the inlet, the excess energy has been disspipated in a manner as to prevent the occurrence of turbulent flows which are entrained through the inlet apertures into the space between the conveyor body and the internal side of the drum.

By shaping the projection of the second end wall as a truncated cone whose pointed end faces the first end wall any air occurring in the feed or being entrained by the feed while flowing into the inlet may be passed away along the periphery of the projection of the second end wall, thereby preventing an air cushion from occurring in the inlet which may interfere in the intended flow. With the stated design of the projection any liberated air will flow along the periphery of the projection and leave the inlet through the axial bore in the projection.

In preferred embodiments of the invention the projection of the second end wall may have substantially radial, longitudinal ribs uniformly distributed along the periphery of the projection, or there may be one or more substantially radial ribs following helices along the periphery of the projection. A larger momentum is thus transferred to the liquid in the inlet in case the free liquid surface approaches the periphery of the projection, e.g. because the rate of flow of the feed increases. By altering the shape of the ribs, e.g. from rectilinear ribs to ribs twisting several times round the projection following a helix, the flow may be directed more strongly towards the second end wall, thereby obtaining an improved axial distribution of the feed, and by altering the radial extension of the ribs it is possible to obtain that the free surface of the liquid does not approach such a small radius that the liquid may discharge through the bore of the inlet pipe in the projection.

An alternative preferred embodiment is characterized in that the first end wall centrally includes a baffle knob protruding towards the inlet pipe. This provides for obtaining an improved control of the inflowing feed when it changes from being an axial flow to being a radial flow because such a sudden change in direction is prevented.

In a further embodiment the baffle knob may have radial ribs uniformly distributed along the periphery of the baffle knob. The ribs may extend along straight lines or helical lines. This may be necessary in order to impart a sufficient rotation to the feed in the inlet with the view of obtaining a stable circulation flow in the inlet.

In other embodiments the inlet may be provided in an exchangeable part of the conveyor body and the baffle knob may be exchangeably secured to the first end wall and the projection containing the axial bore of the inlet pipe may be exchangeably secured to the second end wall. It is obtained by these measures that one and the same decanter centrifuge may be used for various types of feed, in that one or more of said components is/are exchanged.

In a preferred embodiment of the decanter centrifuge according to the invention the inlet pipe may be axially displaceable. It is thus obtained that the diameter of the jet at the baffle knob may be altered by displacement of the inlet pipe, thereby making it possible to adapt the flow in the inlet to the type of feed and/or the rate of flow thereof.

The invention will now be explained in detail by some embodiments and with reference to the drawings, in which

Fig. 1 in a very schematical form shows a section of a decanter centrifuge according to the invention,

Fig. 2 shows an embodiment of the inlet of a decanter centrifuge, as illustrated in Fig. 1,

Fig. 3 shows an inlet as in Fig. 2, in which the path of the flow in the feed in the inlet is indicated,

Fig. 4 shows an inlet as in Fig. 3, in which the projection of the second end wall has two ribs following helices along the periphery of the projection,

Fig. 5 shows an inlet as in Fig. 4, in which the first end wall has an annular projection,

Fig. 6 shows an inlet as in Fig. 2, in which the inlet, the baffle knob and the projection of the second end wall are exchangeably mounted,

Fig. 7 is a schematical view of a baffle knob with retilinear ribs, and

Fig. 8 is a schematical view of a baffle knob with helical ribs.

The decanter centrifuge illustrated in Fig. 1 includes a drum 1, rotatably journalled in bearings 22 at each end. A conveyor 2 is rotatably journalled in drum 1 in relation to the drum by means of bearings 23 at each end. Conveyor 2 comprises a conveyor body 3 with an external helical flight 21. The conveyor body 3 includes an inlet 4 axially defined by a first end wall 11 and a second end wall 13. Inlet 4 is radially defined by a wall 5 that is coaxial with the conveyor body 3 and comprises inlet apertures 6 connecting the inlet 4 with the space 7 between the conveyor body 3 and the internal side of drum 1. The decanter centrifuge further inlcudes an inlet pipe 8 having a mouth 16 directed towards inlet 4.

Fig. 2 illustrates inlet 4 with the end wall 11 having centrally a baffle knob 12, in this embodiment shaped as an approximately spherical face smoothly merging into end wall 11 which per se constitutes a smooth transition to the radially confining wall 5. Opposite the baffle knob the second end wall 13 has a projection 14 which includes a bore 15 for inlet pipe 8 and is coaxial with the drum axis. Projection 14 has the shape of a truncated cone whose small end faces the baffle knob. At the large end projection 14 merges smoothly into end wall 13 which per se merges smoothly into wall 5. Six, substantially radial, slightly helical, longitudinal ribs 17 uniformly distributed along the periphery of the projection are positioned on the periphery of projection 14. The mouth of inlet pipe 8 is situated in a plane perpendicular to the drum axis. Inlet pipe 8 is axially displaceable, thereby allowing the distance between mouth 16 and baffle knob 12 to be varied. The adjustment of this distance may according to choice be effected during operation and the variation of the distance may be effected manually or automatically by means of a control mechanism, not shown.

The radial wall 5 is provided with inlet apertures 6 all of which are positioned between the helical flight 21. The apertures are, moreover, provided uniformly across the entire axial extension of wall 5. The liquid may then flow freely from the inlet through the inlet apertures into space 7 without passing members capable of provoking turbulence and vortices.

Fig. 3 illustrates the flow paths in the inlet. In dashed lines the upper half of the figure shows various characteristic flow areas through which the feed flows when passing the inlet.

Arrows in the lower half of the figure shows the direction of the non-tangential velocities of the feed in the inlet.

The path of the feed through the inlet may be described as follows. The feed leaves inlet pipe a and continues in a jet towards baffle knob 12 at which it is radially dispersed between the baffle knob and a vortex area 31 located at the free liquid surface. The feed subsequently passes into an agitation zone 30 in which a mixing is effected with liquid from a radially external area 33 of the inlet, thereby increasing the angular velocity of the feed. Said angular velocity is somewhat smaller than the angular velocity in the adjacent zone 33, the so-called dissipation area, and the feed will therefore be forced back towards the liquid surface in the direction towards the radial outer edges of ribs 17. In view of the fact that the ribs rotate with the same speed as the conveyor body, the liquid in this area is imparted an angular acceleration preventing the liquid from penetrating further towards projection 14. The ribs are slightly helical, thereby forcing the liquid towards end wall 13. In the area of acceleration 32 the feed attains the same angular velocity as the ribs whereas the excess energy brought about by this acceleration occurs as a radial velocity carrying the feed into the disspipation area 33 throughout the length of projection 14.

Through a turbulent flow the radial velocity in the dissipation area 33 is converted to a temperature rise in the feed and a mixing takes place so that the high angular velocity in the liquid coming from ribs 17 is converted to an average angular velocity in the liquid moving radially towards area 34 surrounding inlet apertures 6. The three inlet apertures 6 are positioned between the flights so that there are no edges capable of imparting turbulence or retaining threads or similar bigger particles in the feed. The apertures are so large that they do not form any restriction to the flow and as they follow the flights they are axially displaced in relation to each other and cover almost the entire length of the circularly cylindrical wall 5. By the passage of one of the inlet apertures the feed is imparted a small supplementary acceleration, but this influence is only slight because the feed already has obtained approximately the same angular velocity as the conveyor body on said location.

The figure shows that the end walls 11 and 13 merge smoothly into the circularly cylindrical wall 5. This is not a necessary prerequisite in order that the inlet functions as explained above. If the transition between the end walls and the circularly cylindrical wall were designed as a right-angled corner a stationary flow would just be created in this corner and would not interfere with the above mentioned flows. In such a case it would be possible that a sediment from the feed would precipitate on the actual spot, and this might necessitate a cleaning of the inlet after some time in operation. In order to avoid this, the various faces of the inlet should merge smoothly into each other.

The inlet illustrated in Fig. 4 has ribs 17 that are helically positioned along the circumference of

projection 14. Such ribs provoke a stronger flow in the area of acceleration 32 towards end wall 13 than the ribs 17 shown in Fig. 3. Six inlet apertures 6 all of which are positioned between the screw flights 21 are provided in this latter embodiment of the inlet.

The inlet illustrated in Fig. 5 has an end wall 11 with an angular projection 20 which on the radially internal and external side of the projection merges smoothly into end wall 11. With such a projection it is possible to obtain a strong control of the flow path in the inlet and by comparison with the upper half of Fig. 3 it is apparent that the projection divides the agitation zone from the dissipation zone, thereby forcing the feed to flow through a longer distance, thereby disspitating its energy prior to approaching the inlet area 34.

Fig. 6 illustrates an inlet substantially designed as the inlet in Fig. 2, but the inlet portion proper is designed as a separate component joined with conveyor body 3 by bolts 25 and flanges on the conveyor body. Baffle knob 12 is also designed as a separate component fixedly bolted on end wall 11 by means of a central bolt 26. Projection 14 is likewise designed as a separate component which through bolts 27 is fixedly bolted on end wall 13.

By the adaptation of a decanter centrifuge according to the invention to a specific form of operation, the described inlet offers great possibilities of varying the size and the shape of the various members concerned with the view of obtaining an optimum yield. The radius of the inlet may be altered only within narrow limits, but it is possible to extend the inlet in the axial direction. In this respect, it must be taken into account that an extension of the inlet generally implies that projection 14 has to be extended too, because it is necessary to control the internal surface of the liquid in the inlet in order to ensure that it does not penetrate so far towards the axis of rotation that the liquid discharges through bore 15 in the projection. If the inlet apertures 6 of a long inlet are uniformly distributed throughout wall 5, there is a risk that part of the feed will only have a short path through the inlet before passing an inlet aperture and penetrating into space 7. In such a case it may be advantageously to make use of an end wall 11 with an annular projection 20, as illustrated in Fig. 5.

The function of ribs 17 throughout a large span of flow rates is to prevent overflow through bore 5, to impart angular velocity to the feed and to distribute the feed axially throughout the entire inlet, thereby enabling excess energy originating from the acceleration to dissipate throughout the entire dissipation area 33 of the inlet. The axial extension of ribs 17 must therefore be adapted to the axial length of the inlet. The ribs 17 should, however, cover the area at the inlet apertures. Radially the ribs must be positioned on the smallest possible radius, in respect of the diameter of the inlet pipe and also of the bore 15, and the length and also the strength of projection 14.

The individual rib may extend completely axially, at a constant angle in relation to the axis of rotation or at a variable angle in relation to the axis. The angle in relation to the axis caters for the axial distribution of the feed throughout the dissipation area 33 and must be adapted to the rate of flow, the type of feed to be separated and the axial extension of ribs 17 and inlet 4, as mentioned above. The ribs are designed so that hair and threads in the feed do not settle and cling to edges but are thrown off. The purpose of the baffle knob is to alter the direction of the feed so that it is carried into the agitation area 30 with a minimum interference with the free surface of the feed in the inlet and so as to obtain a uniform distribution across the surface of end wall 11. If ribs 17 on projection 14 do not result in the desired rotation there may, as illustrated in Fig. 6, be provided radial ribs 19 uniformly distributed along the periphery of the baffle knob and following straight lines, as shown in Fig. 7, or helices, as shown in Fig. 8. Said ribs should likewise be shaped so that hair and threads do not settle.

By passing through inlet apertures 6 into space 7, a small acceleration is imparted to the feed, as mentioned above. With the view of reducing this supplementary acceleration, it is advantageous that the thickness of material in the area at the inlet apertures is as small as allowed by the considerations relating to strength and wear.

In respect of the fact that the inlet apertures are located beneath the free surface of the liquid in the inlet, only very small quantities of air may discharge through the inlet. This is the reason why the projection, as mentioned above, is advantageously given the form of a truncated cone, whereby possible air in the inlet may be carried back along the inlet pipe.

In decanter centrifuges having rotating inlet pipes journalled within the conveyor body, means of ensuring that the inlet may be vented through the bearing should be provided. In such a decanter centrifuge it is possible to further improve the separation by establishing partial vacuum in the inlet by exhaustion. Such a partial vacuum reduces the energy to be dissipated, some of the excess energy being in this case used to compensate for the partial pressure.

Claims

1. A decanter centrifuge comprising a rotatably journalled drum (1) having at one end outlet openings (9) for the separated liquid phase,

and a conveyor (2) rotatably journalled in the drum with a conveyor body (3) containing an inlet (4) in the form of a cavity for the feed to be separated, said inlet (4) being radially defined by a wall (5) coaxial with the conveyor body and provided with inlet apertures (6) located between two adjacent flights of the conveyor and connecting the inlet (4) with the space (7) between the conveyor body (3) and the internal side of the drum (1), the inlet (4) being axially defined by a rotationally symmetrical first end wall (11) and a second end wall (13) located opposide the first end wall (11), said second end wall (13) haying a central projection (14) extending towards the first end wall (11) and containing an axial bore (15) for an inlet pipe (8) for the feed, said inlet pipe (8) being coaxial with the drum, and having a mouth (16) facing the inlet and being located in a plane perpendicular to the axis of the drum, characterized in that the mouths of the inlet apertures (6) in the inlet (4) are located on a radius greater than the radius to the outlet openings (9), that a peripheral area of the inlet (4), outwardly defined by the radius to the inlet apertures (6) is free of carriers, inwards extending projections or the like, that the second end wall (13) is rotationally symmetrical and that the projection (14) of the second end wall (13) has the shape of a truncated cone whose pointed end faces the first end wall (11).

2. A decanter centrifuge as claimed in claim 1 characterized in that the projection (14) of the second end wall (13) has a substantially radial rib (17) following a helix along the periphery of the projection.

3. A decanter centrifuge as claimed in claim 1 characterized in that the projection (14) of the second end wall has several, substantially radial ribs (17) following helices along the periphery of the projection.

4. A decanter centrifuge as claimed in claim 1 characterized in that the projection (14) of the second end wall (13) is provided with substantially radial, longitudinal ribs (17) uniformly distributed along the periphery of the projection.

5. A decanter centrifuge as claimed in any of the preceding claims, characterized in that the first end wall (11) centrally is provided with a baffle knob (12) protruding towards the inlet pipe (8).

6. A decanter centrifuge as claimed in any of the preceding claims, characterized in that the baffle knob (12) has substantially radial ribs uniformly distributed along the periphery of the baffle knob.

7. A decanter centrifuge as claimed in claim 6, characterized in that the substantially radial ribs of the baffle knob (12) follow helices along the periphery of the baffle knob.

8. A decanter centrifuge as claimed in any of the preceding claims, characterized in that the first end wall (11) has an annular projection (20) facing the inlet pipe (8).

9. A decanter centrifuge as claimed in any of the preceding claims, characterized in that the conveyor body (3) has an exchangeable part (24) accommodating the inlet (4).

10. A decanter centrifuge as claimed in claims 5 to 9, characterized in that the baffle knob (12) is exchangeably secured to the first end wall (11).

11. A decanter centrifuge as claimed in any of the preceding claims, characterized in that the projection (14) containing an axial bore (15) for the inlet pipe (8) is exchangeably secured to the second end wall (13).

12. A decanter centrifuge as claimed in any of the preceding claims, characterized in that the inlet pipe (8) is axially displaceable.

Patentansprüche

1. Dekantierzentrifuge umfassend eine rotierbar gelagerte Trommel (1), die an einem Ende Auslassöffnungen (9) für die abgeschiedene Flüssigkeitsphase aufweist, und eine in der Trommel rotierbar gelagerte Schnecke (2) mit einem Schneckenkörper, der einen als Hohlraum ausgebildeten Einlauf (4) für das abzuscheidende Zufuhrmaterial aufweist, welcher Einlauf (4) radial durch eine mit dem Schnekkenkörper koaxiale Wand (5) abgegrenzt ist, die zwischen zwei benachbarten Schneckenwindungen der Schnecke angeordnete Einlassöffnungen (6) hat, welche den Einlauf (4) mit dem zwischen dem Schneckenkörper (3) und der Innenseite der Trommel (1) liegenden Raum (7) verbinden, wobei der Einlauf (4) von einer rotationssymmetrischen ersten Endwand (11) und einer der ersten Endwand (11) gegenüberliegenden zweiten Endwand (13) axial abgegrenzt ist, und die zweite Endwand (13) einen in Richtung zur ersten Endwand (11) verlaufenden zentralen Vorsprung (14) mit einer axialen Bohrung (15) für ein Einlaufrohr (8) für

das Zufuhrmaterial aufweist, welches Einlaufrohr (8) koaxial mit der Trommel ist und eine dem Einlauf zuwendende und in einer Ebene rechtwinkelig zur Trommelachse liegende Mündung (16) hat, dadurch **gekennzeichnet,** dass die Mündungen der Einlauföffnungen (6) im Einlauf (4) auf einem Radius liegen, der grösser ist als der Radius zu den Auslauföffnungen (9), dass der Peripheriebereich des Einlaufs (4), der nach aussen vom Radius zu den Einlauföffnungen (6) abgegrenzt ist, frei von Mitnehmern, nach innen verlaufenden Vorsprüngen und dergleichen ist, dass die zweite Endwand (13) rotationssymmetrisch ist, und dass der Vorsprung (14) der zweiten Endwand (13) die Form eines Kegelstumpfes hat, dessen spitzes Ende der ersten Endwand (11) zuwendet.

2. Dekantierzentrifuge nach Anspruch 1, dadurch **gekennzeichnet,** dass der Vorsprung (14) der zweiten Endwand (13) eine im wesentlichen radiale Rippe (17) aufweist, die einer Schraubenlinie entlang der Peripherie des Vorsprungs folgt.

3. Dekantierzentrifuge nach Anspruch 1, dadurch **gekennzeichnet,** dass der Vorsprung (14) der zweiten Endwand (13) mehrere, im wesentlichen radiale Rippen (17) aufweist, die Schraubenlinien entlang der Peripherie des Vorsprungs folgen.

4. Dekantierzentrifuge nach Anspruch 1, dadurch **gekennzeichnet,** dass der Vorsprung (14) der zweiten Endwand (13) mit im wesentlichen radialen, in der Längsrichtung verlaufenden Rippen (17) versehen ist, die entlang der Peripherie des Vorsprungs gleichmässig verteilt sind.

5. Dekantierzentrifuge nach einem der vorhergehenden Ansprüche, dadurch **gekennzeichnet,** dass in der Mitte der ersten Endwand (11) ein in Richtung zum Einlaufrohr (8) vorspringender Anprallknopf (12) vorgesehen ist.

6. Dekantierzentrifuge nach einem der vorhergehenden Ansprüche, dadurch **gekennzeichnet,** dass der Anprallknopf (12) im wesentlichen radiale Rippen (17) aufweist, die entlang der Peripherie des Anprallknopfes gleichmässig verteilt sind.

7. Dekantierzentrifuge nach Anspruch 6, dadurch **gekennzeichnet,** dass die im wesentlichen radialen Rippen des Anprallknopfes (12) Schraubenlinien entlang der Peripherie des Anprallknopfes folgen.

8. Dekantierzentrifuge nach einem der vorhergehenden Ansprüche, dadurch **gekennzeichnet,** dass die erste Endwand (11) einen dem Einlaufrohr (8) zuwendenden ringförmigen Vorsprung (20) aufweist.

9. Dekantierzentrifuge nach einem der vorhergehenden Ansprüche, dadurch **gekennzeichnet,** dass der Schneckenkörper (3) einen auswechselbaren Teil (24), in welchem der Einlauf (4) angeordnet ist, umfasst.

10. Dekantierzentrifuge nach den Ansprüchen 5-9, dadurch **gekennzeichnet,** dass der Anprallknopf (12) an die erste Endwand (11) auswechselbar befestigt ist.

11. Dekantierzentrifuge nach einem der vorhergehenden Ansprüche, dadurch **gekennzeichnet,** dass der Vorsprung (14), der die axiale Bohrung (15) für das Einlaufrohr (8) enthält, an die zweite Endwand (13) auswechselbar befestigt ist.

12. Dekantierzentrifuge nach einem der vorhergehenden Ansprüche, dadurch **gekennzeichnet,** dass das Einlaufrohr (8) axial verschiebbar ist.

Revendications

1. Séparateur centrifuge comprenant un tambour (1) logé à rotation et comportant, à une extrémité, des orifices de sortie (9) de phase liquide séparée, et un convoyeur (2) logé à rotation dans le tambour, avec un corps de convoyeur (3) comportant une entrée (4) sous la forme d'une cavité pour l'alimentation à séparer, ladite cavité (4) étant radialement définie par une paroi (5) coaxiale au corps de convoyeur et pourvue d'orifices d'entrée (6) situés entre deux volées adjacentes du convoyeur et reliant l'entrée (4) à l'espace (7) entre le corps de convoyeur (3) et la face interne du tambour (1), l'entrée (4) étant axialement définie par une première paroi terminale (11), symétrique de rotation, et par une seconde paroi terminale (13) face à la première paroi terminale (11), ladite seconde paroi terminale (13) comportant une protubérance centrale (14) qui s'étend vers la première paroi terminale (11) et présente un perçage axial (15) pour un tube d'entrée (8) d'alimentation, ledit tube d'entrée (8) étant coaxial au tambour et comportant une bouche (16) faisant face à l'entrée et située dans un plan perpendiculaire à l'axe du tambour, **caractérisé** par le fait que les orifices (6) de l'entrée (4) sont situés sur un rayon supérieur au rayon vers les orifices de sortie (9), et

qu'une zone périphérique de l'entrée (4), zone définie extérieurement par le rayon aux orifices d'entrée (6), est libre de supports, protubérances s'étendant vers l'intérieur, ou autres éléments similaires, et en ce que la seconde paroi terminale (13) est symétrique de rotation, et en ce que la protubérance (14) sur la seconde paroi terminale (13) a la forme d'un cône tronqué dont la pointe fait face à la première paroi terminale (11).

2. Séparateur centrifuge selon la revendication 1, **caractérisé** en ce que la protubérance (14) sur la seconde paroi terminale (13) comporte une nervure essentiellement radiale (17) en hélice le long de la périphérie de la protubérance.

3. Séparateur centrifuge selon la revendication 1, **caractérisé** en ce que la protubérance (14) sur la seconde paroi terminale (13) comporte plusieurs nervures essentiellement radiales (17) en hélices le long de la périphérie de la protubérance.

4. Séparateur centrifuge selon la revendication 1, **caractérisé** en ce que la protubérance (14) sur la seconde paroi terminale (13) comporte des nervures essentiellement radiales, longitudinales (17) uniformément réparties sur la périphérie de la protubérance.

5. Séparateur centrifuge selon une quelconque des revendications précédentes, **caractérisé** en ce que la première paroi terminale (11) présente, centralement, un bouton déflecteur (12) faisant saillie vers le tube d'entrée (8).

6. Séparateur centrifuge selon une quelconque des revendications précédentes, **caractérisé** en ce que le bouton déflecteur (12) présente des nervures essentiellement radiales, uniformément réparties sur la périphérie du bouton déflecteur.

7. Séparateur centrifuge selon la revendication 6, **caractérisé** en ce que les nervures essentiellement radiales du bouton déflecteur (12) sont en hélice sur la périphérie du bouton déflecteur.

8. Séparateur centrifuge selon une quelconque des revendications précédentes, **caractérisé** en ce que la première paroi terminale (11) présente une protubérance annulaire (20) faisant face au tube d'entrée (8).

9. Séparateur centrifuge selon une quelconque des revendications précédentes, **caractérisé** en ce que le corps de convoyeur (3) comporte une pièce remplaçable (24) logeant l'entrée (4).

10. Séparateur centrifuge selon les revendications 5 à 9, **caractérisé** en ce que le bouton déflecteur (12) est fixé de façon amovible sur la première paroi terminale (11).

11. Séparateur centrifuge selon une quelconque des revendications précédentes, **caractérisé** en ce que la protubérance (14) contenant un perçage axial (15) pour le tube d'entrée (8) est fixée de façon amovible à la seconde paroi terminale (13).

12. Séparateur centrifuge selon une quelconque des revendications précédentes, **caractérisé** en ce que le tube d'entrée (8) est axialement déplaçable.

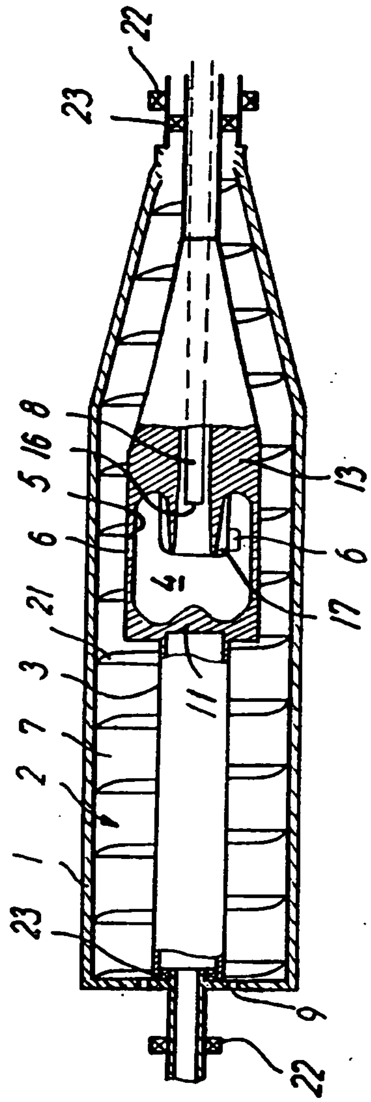

FIG.1

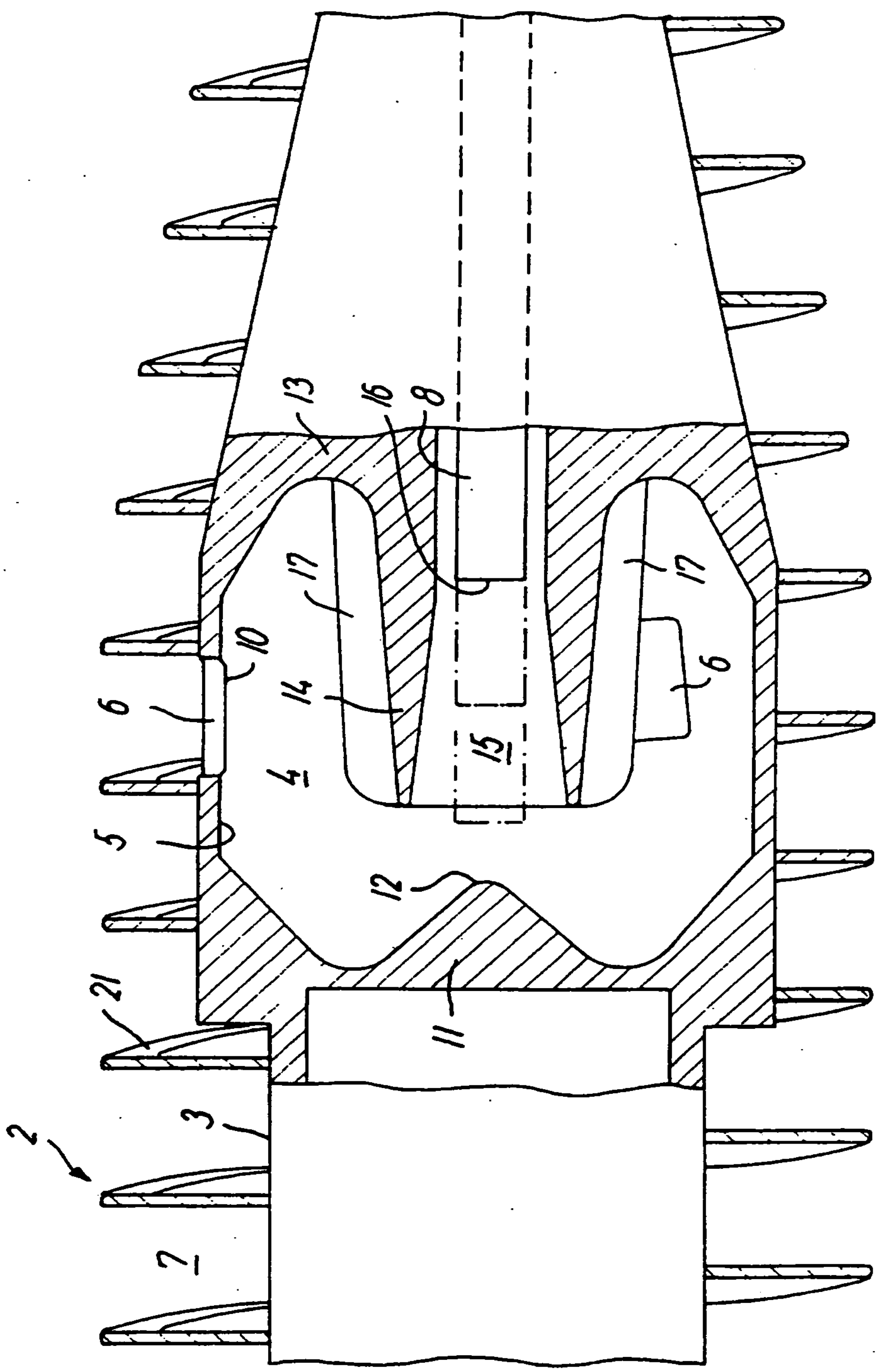

FIG.2

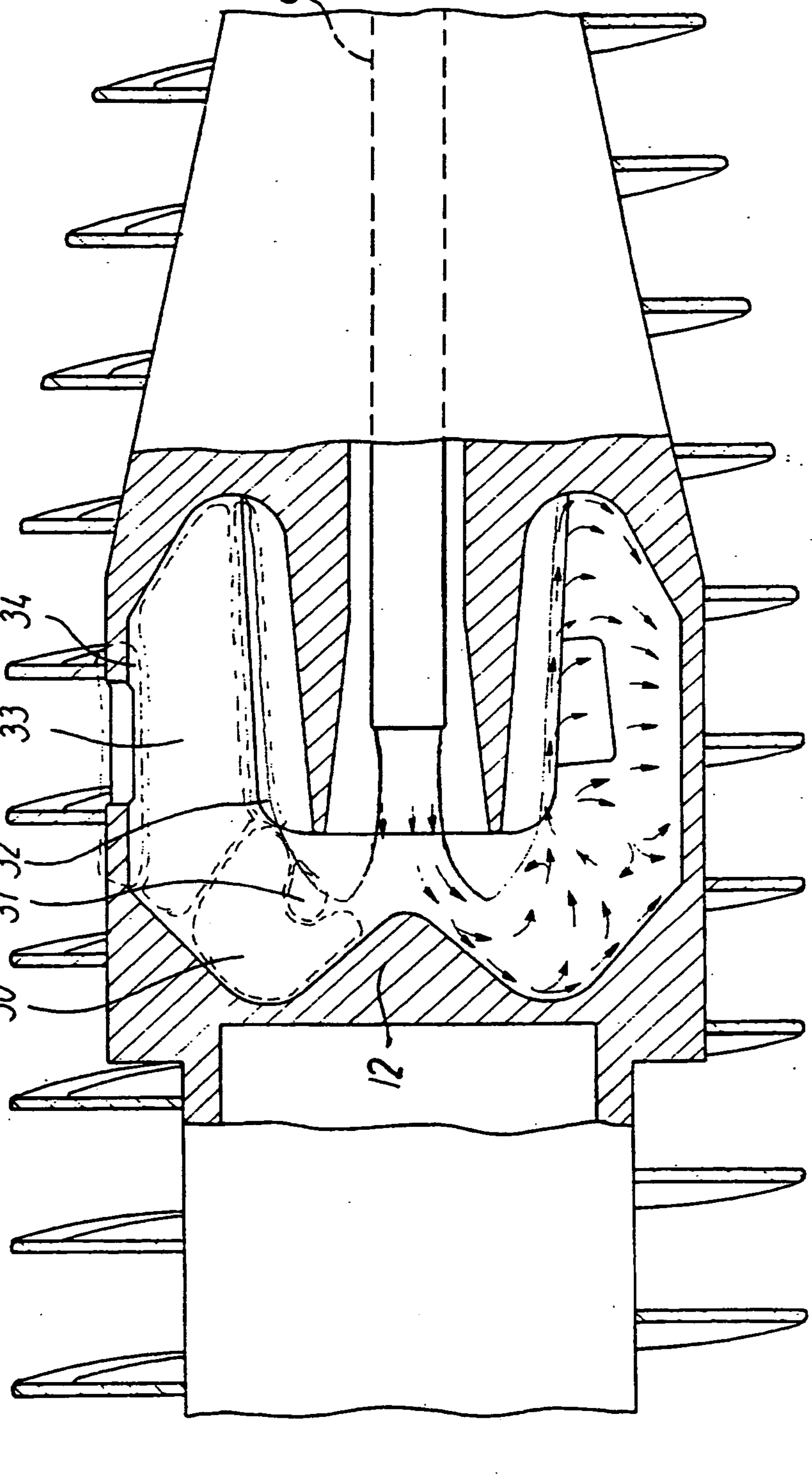

FIG.3

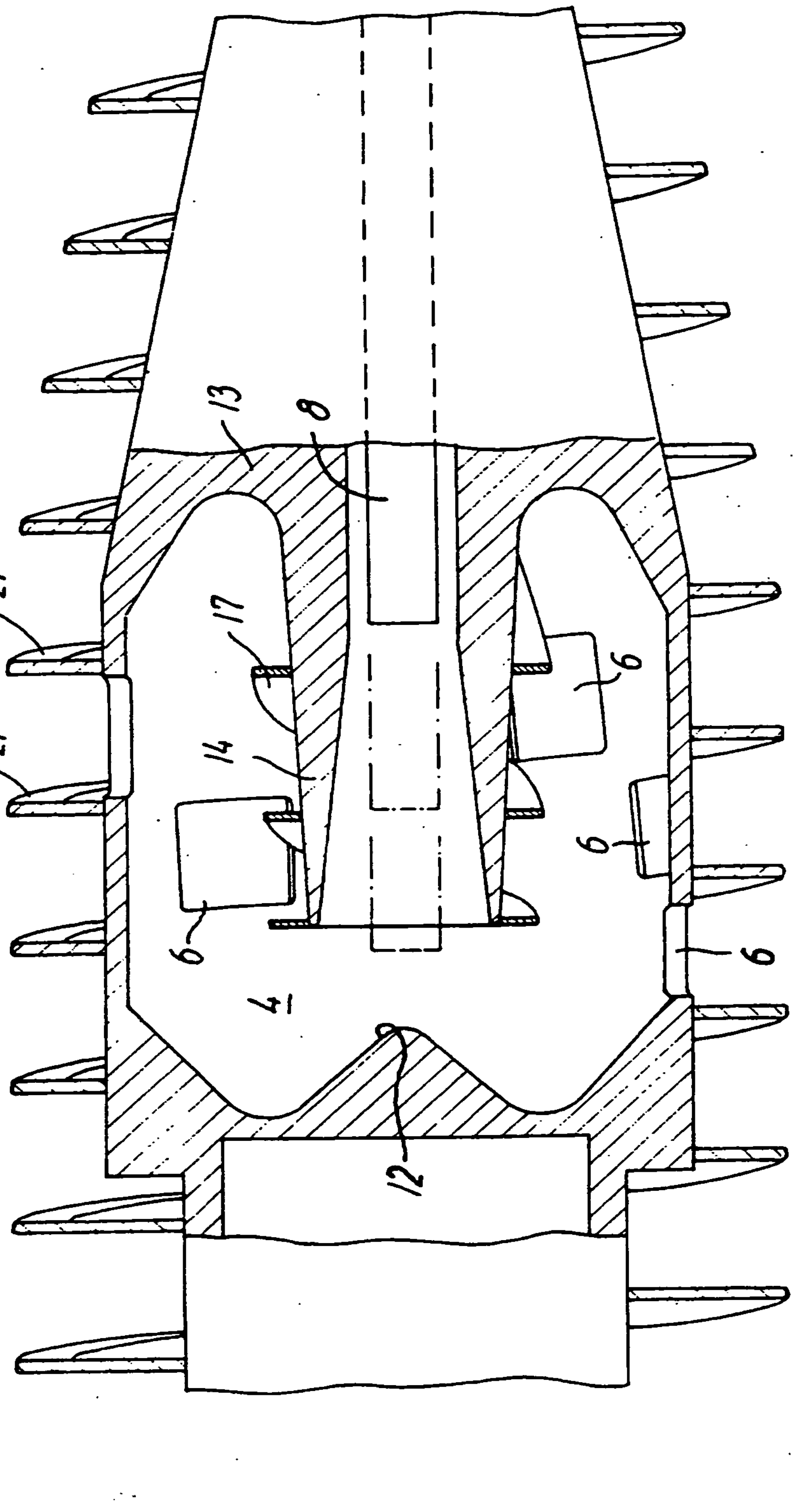

FIG.4

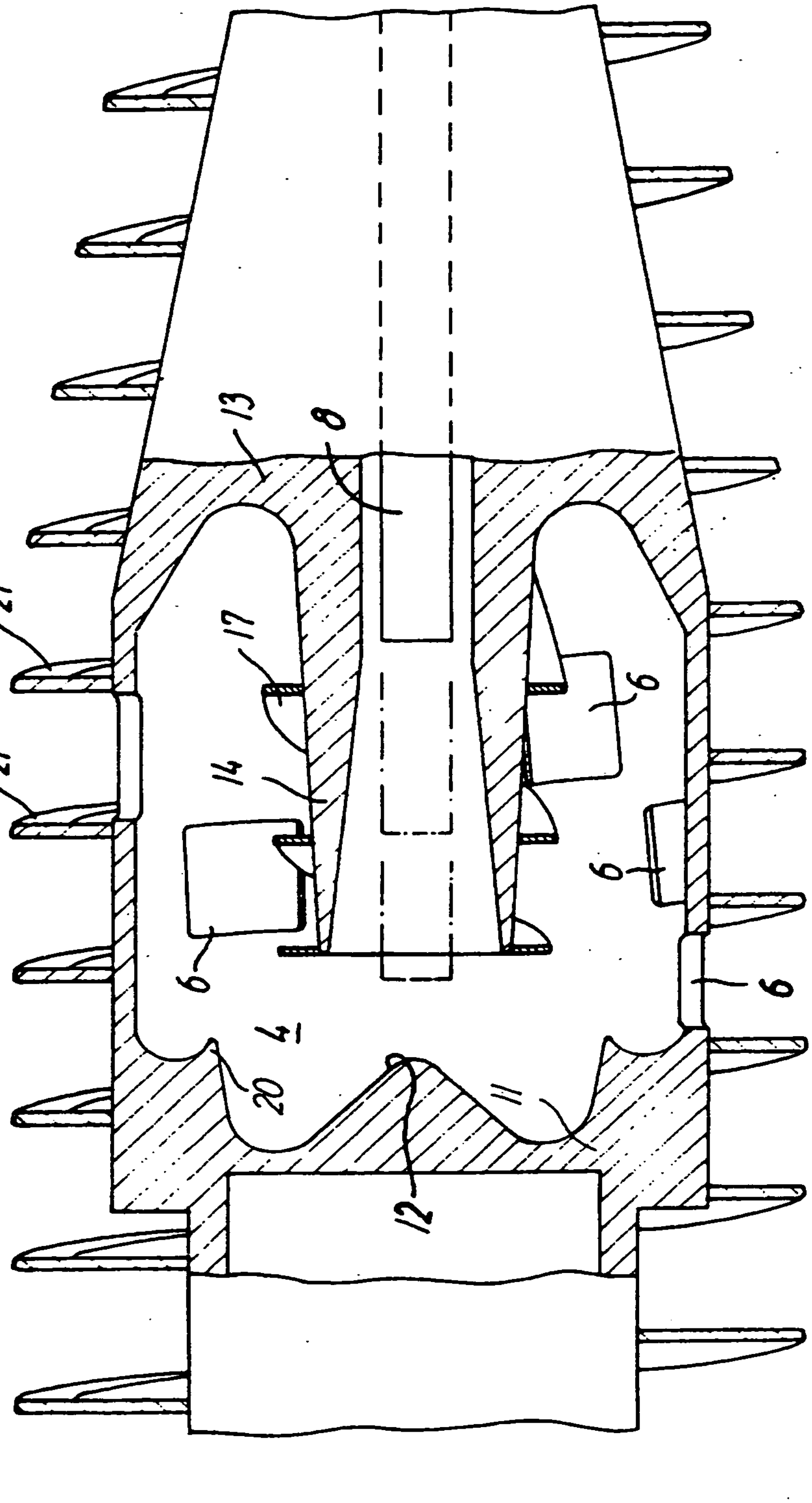

FIG.5

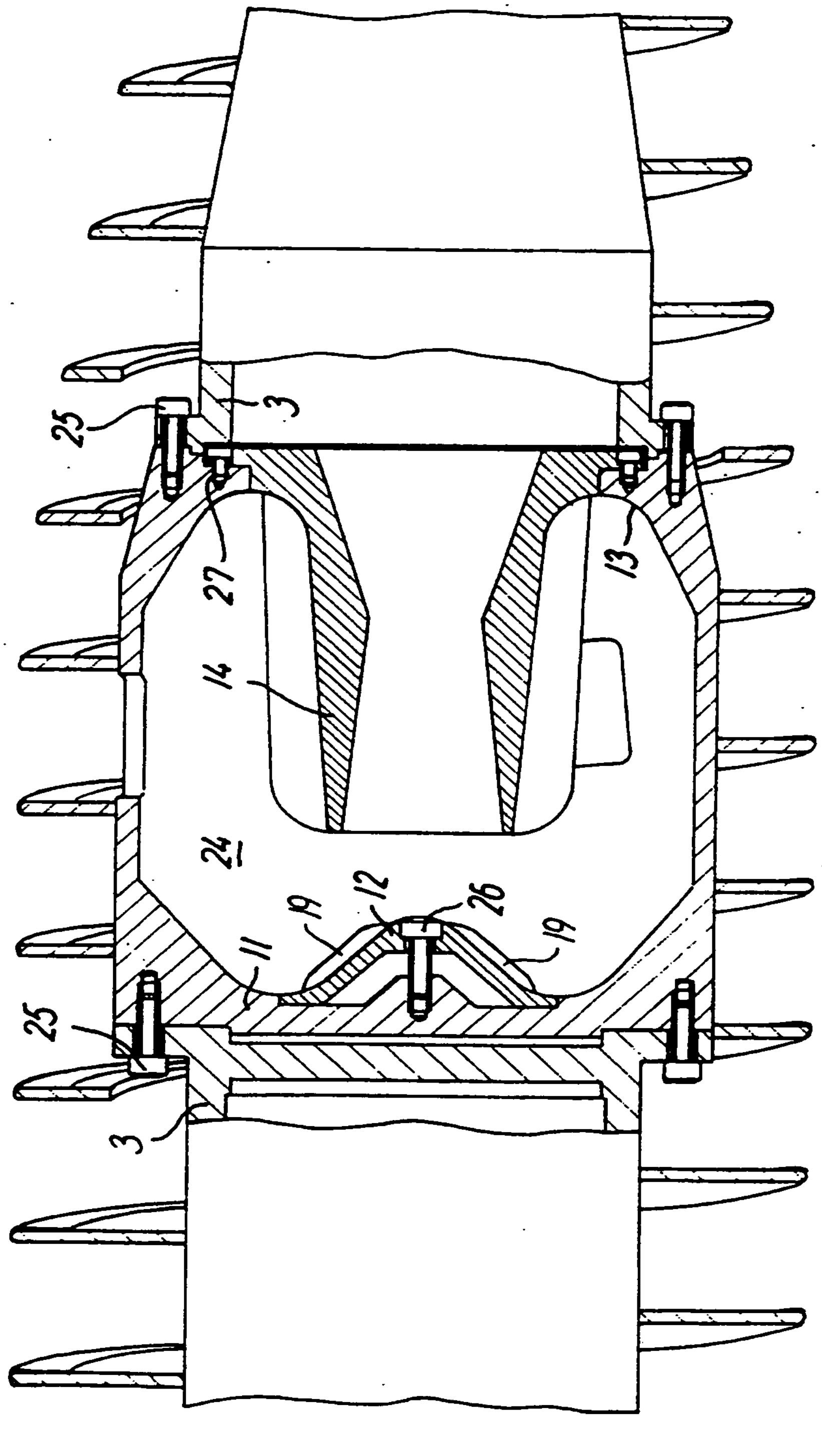

FIG.6

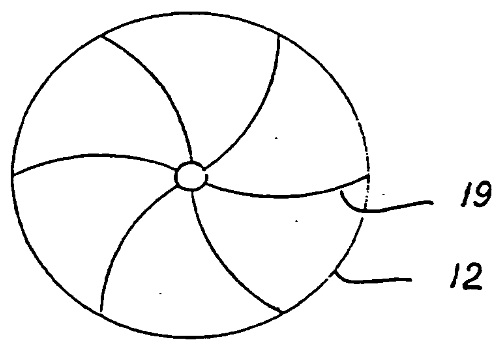

FIG.7

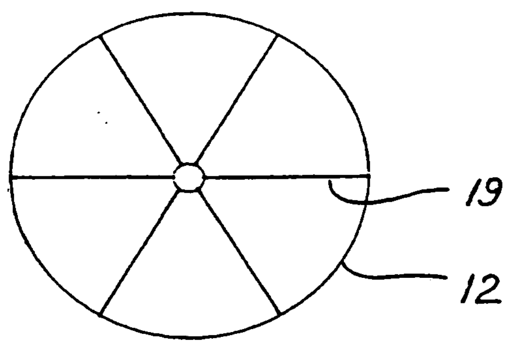

FIG.8